

Kenneth S. Kump

S/N: 10/711,762

**In the Claims**

1. (Original) An x-ray imaging system comprising:  
an x-ray detector configured to detect radiation emitted by an x-ray source and attenuated by a subject to be imaged, and provide an electrical output that may be processed for reconstruction of an image of the subject; and  
at least one electronic sensor configured to detect gravitational loads placed on the x-ray detector.
2. (Original) The system of claim 1 wherein the x-ray detector includes a circuit board with electronics to control operation of the detector and wherein the at least one electronic sensor is disposed on the circuit board.
3. (Original) The system of claim 1 wherein the at least one electronic sensor is powered by a power supply of an x-ray scanner when the x-ray detector is tethered to the x-ray scanner.
4. (Original) The system of claim 1 further comprising a battery disposed in the x-ray detector that provides power to the at least one electronic sensor.
5. (Original) The system of claim 1 further comprising a controller configured to read out data from the at least one electronic sensor at predefined intervals.
6. (Original) The system of claim 5 wherein the controller is configured to read out data from the electronic sensor at 250 μs intervals.
7. (Original) The system of claim 5 wherein the controller is further configured to assign at least one of a time and a date stamp to each reading of an electronic sensor.
8. (Original) The system of claim 7 wherein the controller is further configured to store readings from an electronic sensor in a log.

Kenneth S. Kump

S/N: 10/711,762

9. (Original) The system of claim 8 wherein the controller is further configured to write over readings stored on the log such that a limited number of readings are stored in the log.

10. (Original) The system of claim 9 wherein the controller is further configured to compare the gravitational load from a current reading of an electronic sensor to that of a stored reading in the log and if the gravitational load of the current reading exceeds that of the stored reading, then overwrite the stored reading with the current reading.

11. (Original) The system of claim 5 wherein the controller is further configured to compare the gravitational load of a current reading of an electronic sensor to a threshold and illuminate an LED on the x-ray detector based on the comparison.

12. (Original) The system of claim 11 wherein the controller is further configured to illuminate a failure LED if the gravitational load of a current reading of an electronic sensor is equal to or greater than a maximum allowable gravitational load.

13. (Original) The system of claim 11 wherein the controller is further configured to power down electronics of the x-ray detector if the gravitational load of a current reading of an electronic sensor is equal to or greater than a maximum allowable gravitational load.

14. (Original) The system of claim 11 wherein the controller is further configured to provide an error message to a processor to be used to warn a user of a potentially damaging gravitational event.

15. (Original) The system of claim 11 wherein the controller is further configured to proactively initiate and report self-test diagnostics in response to a threshold exceeding gravitational event.

16. (Original) The system of claim 11 wherein the threshold is 10G.

17. (Original) The system of claim 1 wherein the x-ray detector includes flash storage connected to store data output by the electronic sensor.

Kenneth S. Kump

S/N: 10/711,762

18. (Original) The system of claim 1 further comprising one or more mechanical sensors that mechanically detect gravitational loads placed on the x-ray detector.

19. (Original) The system of claim 18 wherein the one or more mechanical sensors includes a fluid filled label sealed to a surface of the x-ray detector, wherein the fluid changes color when exposed to a given gravitational load.

20. (Original) The system of claim 1 wherein the at least one electronic sensor includes a plurality of accelerometers.

21. (Original) An x-ray detector comprising:  
a scintillator configured to emit light in response to reception of radiation;  
a detector element array having a plurality of detector elements, each detector element configured to detect light from the scintillator and provide an electrical signal that may be processed for image reconstruction; and  
an accelerometer configured to detect gravitational events and measure a gravitational load placed on the x-ray detector of a gravitational event.

22. (Original) The x-ray detector of claim 21 wherein the accelerometer is configured to assign at least one of a time and a date to a measured gravitational event.

23. (Original) The x-ray detector of claim 22 wherein the accelerometer includes RAM and is further configured to record data for the measured gravitational event in RAM.

24. (Original) The x-ray detector of claim 23 wherein the accelerometer is further configured to replace recorded data such that data for a single measured gravitational event is recorded.

25. (Original) The x-ray detector of claim 24 wherein the accelerometer is further configured to compare a currently measured gravitational event to the recorded gravitational event and, if the currently measured gravitational event has a greater measured gravitational force than that of the recorded gravitational event, then replace data for the recorded gravitational event with that of the currently measured gravitational event.

Kenneth S. Kump

S/N: 10/711,762

26. (Original) The x-ray detector of claim 23 wherein the RAM is configured to be cleared out following each readout of data stored therein.

27. (Original) The x-ray detector of claim 21 further comprising a battery to power the accelerometer.

28. (Original) The x-ray detector of claim 21 wherein the accelerometer is configured to sample a gravitational load on the x-ray detector at a sampling rate of 4 kHz.

29. (Original) An x-ray scanner comprising:  
an x-ray source configured to project radiation at a subject;  
an x-ray detector configured to detect radiation projected at and attenuated by the subject, the x-ray detector having an electronic means of measuring a gravitational load placed on the x-ray detector; and  
a controller configured to read out data from the electronic means and determine if the x-ray detector has been subjected to a potentially damaging gravitational load.

30. (Original) The x-ray scanner of claim 29 wherein the electronic means includes means for associating at least one of a time and a date to a measured gravitational load event.

31. (Original) The x-ray scanner of claim 29 wherein the controller is further configured to output one of audio and a visual indication that the x-ray detector has been subjected to a potentially damaging gravitational load.

32. (Original) The x-ray scanner of claim 29 wherein the electronic means includes an accelerometer.

33. (Original) The x-ray scanner of claim 29 wherein the controller is further configured to acquire data from the electronic means when the x-ray detector is connected thereto and further configured to maintain a database of data acquired from the electronic means.